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Application No.: 10/731260 Docket No.: CVZ-020

REMARKS

Claims 1-57 are pending of which claims 1, 16 and 51 are independent.

Claim Objections

Claims 1 and 16 were objected to because of a grammatical error (the claims reading "Micro-Electro Mechanical Systems" instead of "Micro Electro-Mechanical System". Appropriate corrections have been made.

Claim Rejections Pursuant to 35 U.S.C. §112

Claims 2-3 were rejected as being indefinite based on "the shape" in claim 2 and "the parameters" in claim 3 lacking antecedent basis. Applicant has amended claims 2 and 3 to address the rejection and believes them now to be in condition for allowance.

Claim Rejections Pursuant to 35 U.S.C. §102

Claims 1-57 were rejected under 35 U.S.C. §102(b) as being anticipated by a publication entitled "AN ENVIRONMENT FOR DESIGN AND MODELING OF ELECTRO-MECHANICAL MICRO-SYSTEMS" (*Journal of Modeling and Simulation of Microsystems*, Vol. 1, No. 1, Pages 65-76, 1999), Zaman, Bart, Gilbert, Swart and Mariappan (hereafter "Zaman"). In light of the Amendments above and remarks below, Applicant respectfully traverses the rejections.

Applicant wishes to note at the outset that the first three co-authors of the Zaman article were employees of Microcosm Technologies, Inc. which was renamed to Coventor, Inc. in January 2001. Coventor, Inc. is the assignee of the claimed invention. Additionally, the MEMCAD software mentioned in the text was an earlier version of the CoventorWare software currently sold by Coventor, Inc. (MEMCAD was renamed as CoventorWare in April 2001). Accordingly, Applicant is well aware of the differences between the cited reference and the claimed invention and has amended the claims herein in an effort to further clarify those distinctions.

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Applicant has added to independent claims 1 and 16 the limitation of:

"performing a simulation by numerically executing the MEMS model, a result of the simulation being displayed in the 3D view so as to portray a mechanical motion of the MEMS"

The patent application discusses how simulation results can be visualized in the 3-D view, effectively providing a 3-D animation of the mechanical motion of the MEMS device. The 3D view generators programmatically provide continuous updates of the individual 3D views to the overall 3D view of the model, resulting in an animation of the mechanical motion of the mechanical device. There is no mention of this concept in the Zaman article. The Examiner cited sections 1, 4, 6-7 and figures 2, 4-5 in the Office Action, page 5, in rejecting claims 38, 48 and 55-56, as showing the display of simulation results in the 3D view. While not agreeing with the Examiner regarding the previous rejection, there is no discussion in the cited sections of portraying a mechanical motion of the MEMS as required by the newly added limitation.

The schematic components in the claimed invention are based on mathematical models, commonly known as "analytical" models that use mathematical analysis, and also "semi-analytical" models that combine mathematics and numerical analysis. Accordingly, Applicants have added to independent claims 1 and 16 the limitation that the MEMS model includes " a plurality of fully parameterized components based on analytical mathematical theory" (independent claim 51 already indicated that the MEMS model components include a mathematical behavioral model). In contrast, the schematic components in the cited Zaman reference, are exclusively derived from detailed 3D numerical modeling (using numerical analysis) based on the finite element method (FEM) and/or boundary-element method (BEM). The creation of the schematic components from FEM-based models is shown in Fig. 11 in Zaman. Unlike the mathematical models of the claimed invention, the numerical component models derived from FEM are not fully parameterized with respect to all geometric and material properties. The independent claims have therefore been amended above in an attempt to clarify this distinction.

Additionally, the system of Zaman functions differently from the claimed invention. The Zaman article discusses 2-D "p-cell" generators that provide a conduit between the symbolic schematic and a tangible 3-D model. This approach has been embodied in CoventorWare since 2001. But the practice of going from a schematic, via 2-D generators, to a complete 2-D layout, and then building a 3-D model via the "MemBuilder" module mentioned in Fig. 6 of Zaman is slow compared to the direct 3-D generation using the 3D view generators claimed in the invention (see claims 10, 25 and 51). Additionally, the Zaman method has the disadvantage of some loss of information between the schematic and the 3-D model. In short, the claimed invention goes directly from schematic to 3-D via 3-D view generators, without going first through the 2-D p-cell generators discussed in Zaman.

Accordingly, as the cited reference fails to disclose all of the limitations of Applicant's independent claims as amended, Applicant requests the allowance of all claims.

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CONCLUSION

In view of the above, Applicant believes the pending application is in condition for allowance.

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Respectfully submitted,

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